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Area Summary

Record the dimensions (using the longest side as the length) and area of each rectangle in the table below.

Area of Rectangles

Rectangle	Length (cm)	Width (cm)	Area ( $\text{cm}^2$ )
<i>A</i>			
<i>B</i>			
<i>C</i>			
<i>D</i>			

- 1 What scale factor could be applied to Rectangle *B* to create Rectangle *D*? Justify your answer.
- 2 How does the area of Rectangle *D* compare to the area of Rectangle *B*?
- 3 What scale factor could be applied to Rectangle *B* to create Rectangle *A*? Justify your answer.
- 4 How does the area of Rectangle *A* compare to the area of Rectangle *B*?
- 5 What scale factor could be applied to Rectangle *A* to create Rectangle *C*? Justify your answer.
- 6 How does the area of Rectangle *C* compare to the area of Rectangle *A*?
- 7 What scale factor could be applied to Rectangle *A* to create Rectangle *D*? Justify your answer.
- 8 How does the area of Rectangle *D* compare to the area of Rectangle *A*?
- 9 Make a conjecture concerning the change in area when a scale factor is applied to the dimensions of a rectangle.



## Unit 7 Lesson 3

### Area Summary

Record the dimensions (using the longest side as the height) and area of each triangle in the table below.

Area of Triangles

Triangle	Base (cm)	Height (cm)	Area (cm <sup>2</sup> )
<i>A</i>			
<i>B</i>			
<i>C</i>			
<i>D</i>			

- 10 What scale factor could be applied Triangle *A* to create Triangle *C*? Justify your answer.
- 11 How does the area of Triangle *C* compare to the area of Triangle *A*?
- 12 What scale factor could be applied to Triangle *A* to create Triangle *D*? Justify your answer.
- 13 How does the area of Triangle *D* compare to the area of Triangle *A*?
- 14 What scale factor could be applied to Triangle *B* to create Triangle *D*? Justify your answer.
- 15 How does the area of Triangle *D* compare to the area of Triangle *B*?
- 16 What scale factor could be applied to Triangle *D* to create Triangle *A*? Justify your answer.
- 17 How does the area of Triangle *A* compare to the area of Triangle *D*?
- 18 Make a conjecture concerning the change in area when a scale factor is applied to the dimensions of a triangle.

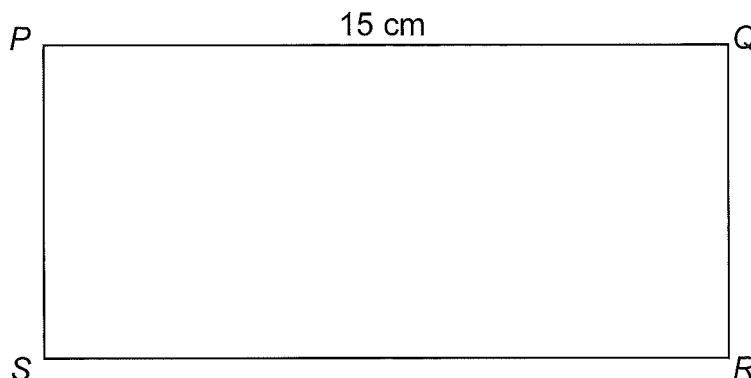
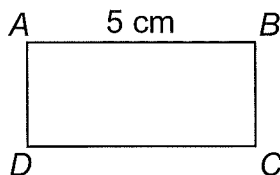


### Independent Practice

When a scale factor is applied to the dimensions of a figure, the area of the new figure changes by the square of the scale factor.

Example:

Rectangle  $ABCD$  is similar to rectangle  $PQRS$ .



If the area of rectangle  $ABCD$  is  $12.5 \text{ cm}^2$ , what is the area of rectangle  $PQRS$ ?

A scale factor of 3 was applied to rectangle  $ABCD$  to create rectangle  $PQRS$ . This means that the area of rectangle  $PQRS$  will be  $3^2$ , or 9, times the area of rectangle  $ABCD$ .

$$\begin{array}{r} 12.5 \\ \times \quad 9 \\ \hline 112.5 \end{array} \text{ so the area of rectangle } PQRS \text{ will be } 112.5 \text{ cm}^2.$$

You can check your answer by finding the missing dimension of rectangle  $ABCD$ . Then, by applying the scale factor to that dimension, you will have the dimensions of rectangle  $PQRS$ . You can then verify the area of rectangle  $PQRS$ .

Missing dimension of  $ABCD$  is 2.5 since  $12.5 \div 5 = 2.5$ .

Multiply 2.5 by the scale factor, 3, to find the corresponding side length of rectangle  $PQRS$ .

$$2.5 \times 3 = 7.5$$

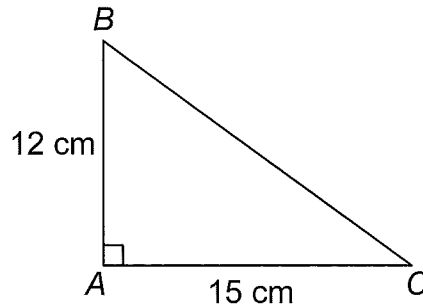
Finally, find the area of  $PQRS$ ,  $15 \times 7.5 = 112.5$ . The original answer has been verified.

- 1 A circle has an area of 6.28 square inches. If a scale factor of 2 is applied to the radius of the circle, what will be the area of the new circle?



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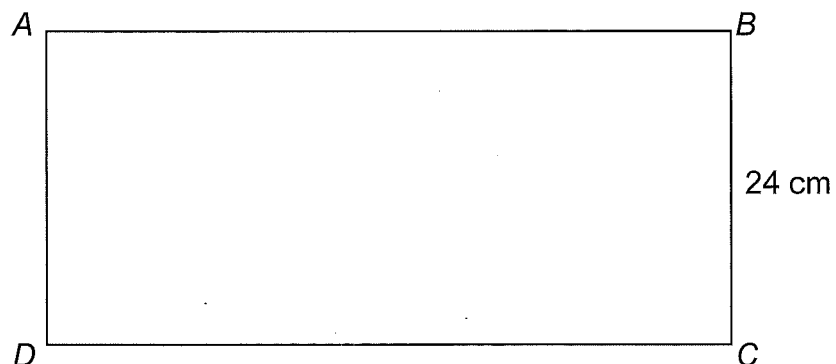
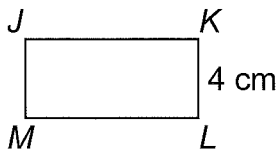
- 2 Triangle  $ABC$  is shown below.



If a scale factor of  $\frac{1}{3}$  is applied to  $ABC$  to create a new triangle, what will be the area of the new triangle?

- 3 Lucy drew a trapezoid that had an area of 64 square centimeters. She asked Ethel to draw a similar trapezoid by applying a scale factor of  $\frac{1}{2}$ . Ethel claims that her trapezoid will have an area of 32 square centimeters. Is she correct? Justify your answer.

- 4 Harry created the 2 similar rectangles shown below.

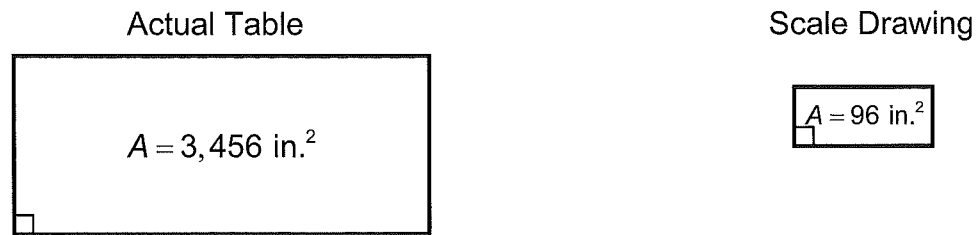


If rectangle  $ABCD$  has an area of 1,440 square centimeters, what is the area of rectangle  $JKLM$ ?



- 5 A parallelogram has a base of 15 inches and a height of 4 inches. If a scale factor of 3 is applied to both the base and the height, what will be the area of the new parallelogram?

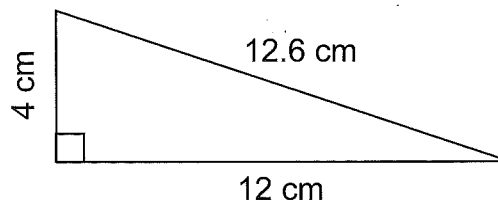
- 6 Mrs. North is making a scale drawing of the arrangement of the tables in her classroom.



What scale factor was applied to the dimensions of the actual table to create the scale drawing?

- 7 A rectangular kitchen measures 8 feet by 12 feet. During a home remodeling project, the kitchen is enlarged so that each of the dimensions is doubled. What is the area of the enlarged kitchen?

- 8 If a scale factor of  $\frac{5}{4}$  is applied to each side of the triangle shown below, what will be its new area?



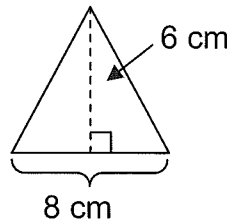


## Unit 7 Lesson 3

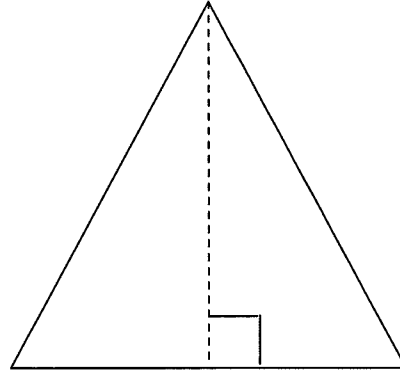
### Timmy's Triangle

Timmy created a triangle similar to the triangle shown below.

Original triangle



Timmy's triangle



Timmy's triangle has an area of 384 square centimeters. What are the dimensions of his triangle? Justify your answer.

FOR TEACHER USE ONLY:

a. YES NO Student arrives at a correct solution?

	4	3	2	1
b. Conceptual Knowledge				
c. Procedural Knowledge				
d. Communication				



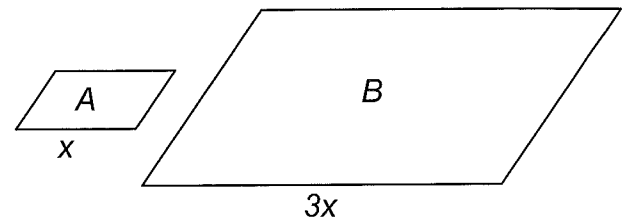
- 1 A rectangular playroom measures 12 feet by 15 feet. During a home remodeling project, the playroom is enlarged so that each of the dimensions is doubled. What is the area of the new playroom?

A  $45 \text{ ft}^2$   
B  $180 \text{ ft}^2$   
C  $360 \text{ ft}^2$   
D  $720 \text{ ft}^2$

- 2 Mrs. Guerra is planning to make a baby quilt that will match the square quilt in her daughter's room. If she applies a scale factor of  $\frac{1}{4}$  to the dimensions of her daughter's quilt, how will the area of the baby quilt be affected?

A The area of the baby quilt will be  $\frac{1}{4}$  the area of her daughter's quilt.  
B The area of the baby quilt will be  $\frac{1}{8}$  the area of her daughter's quilt.  
C The area of the baby quilt will be  $\frac{1}{16}$  the area of her daughter's quilt.  
D The area of the baby quilt will be  $\frac{1}{32}$  the area of her daughter's quilt.

- 3 Parallelogram  $A$  is similar to parallelogram  $B$ .



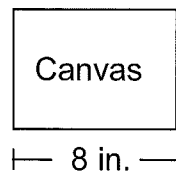
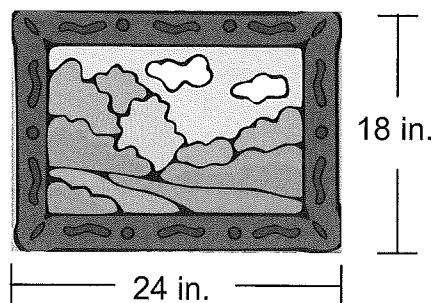
If the area of parallelogram  $B$  is 162 square units, what is the area of parallelogram  $A$ ?

A  $18 \text{ units}^2$   
B  $32 \text{ units}^2$   
C  $45 \text{ units}^2$   
D  $54 \text{ units}^2$



## Unit 7 Lesson 3

- 4 Bobby painted the picture shown below. He wants to paint the scene again on a smaller canvas.



What is the area of the canvas?

- A 48 square inches
- B 54 square inches
- C 72 square inches
- D 144 square inches